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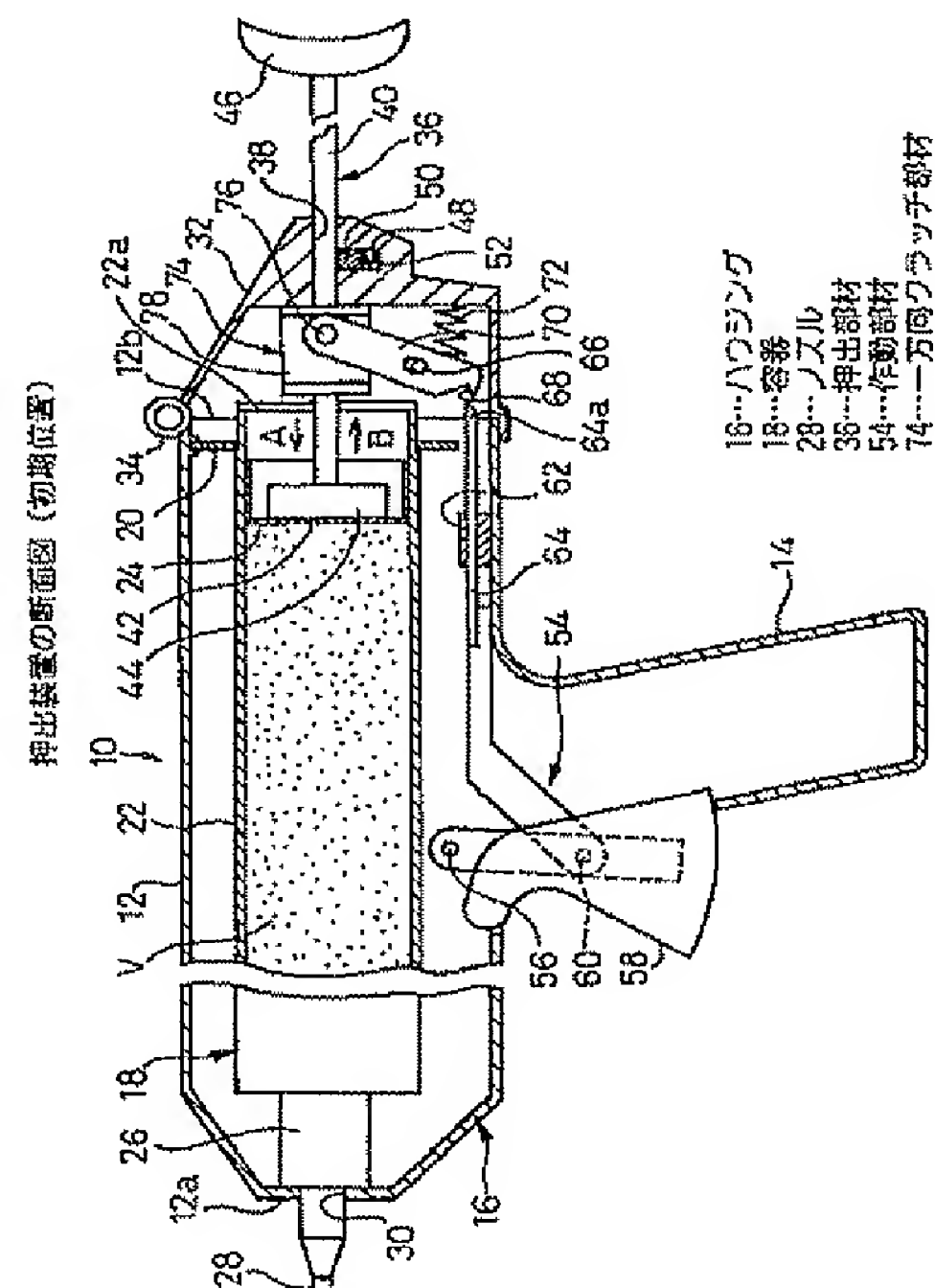
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(54) 【発明の名称】 粘稠液体の押出装置

(57) 【要約】

【課題】 作動部材の操作解除後にノズルから粘稠液体が漏出することを容易に防止できる操作性に優れた粘稠液体の手動式押出装置を提供する。

【解決手段】 押出装置10のハウジング16には、粘稠液体Vを封入した筒状の容器18が收容される。押出部材36は、蓋部材32に軸線方向移動可能に支持される軸棒40を備える。作動部材54は、手動操作により一方向クラッチ部材74を第1方向Aへ移動させる。一方向クラッチ部材74は、作動部材54の操作時に、軸棒40に係合して押出部材36と共に第1方向Aへ移動し、作動部材54の操作解除時に、押出部材36を解放して第2方向Bへ移動する。このとき、クラッチ部材74自体が停止するまでの間、押出部材36の第2方向Bへの移動が許容される。その結果、作動部材54の操作解除後に、ノズル28からの粘稠液体Vの漏出が防止される。



## 【特許請求の範囲】

【請求項1】 粘稠液体を封入した容器を収容するハウジングと、該ハウジングの一端で該容器に連結されるノズルと、前記ハウジングの他端に軸線方向移動可能に支持され、前記一端に向かう第1方向へ移動したときに前記容器を変形して前記ノズルから粘稠液体を押し出す押出部材と、該押出部材に係合可能に前記ハウジングに装備され、該押出部材の前記第1方向への移動を許容するとともに前記他端に向かう第2方向への移動を制限する一方向クラッチ手段と、前記ハウジングに装備され、手動操作により前記押出部材を前記第1方向へ移動させる作動部材とを具備した粘稠液体の押出装置において、前記一方向クラッチ手段は、

前記押出部材と前記作動部材との間に機能的に介在され、該作動部材に連動して、前記ハウジング内で該押出部材の移動方向に平行な前記第1及び第2方向へ選択的に移動可能な一方向クラッチ部材からなり、

該一方向クラッチ部材が、

該第1方向へ移動するときに該押出部材に係合して、該押出部材を該第1方向へ移動させるとともに、

該第2方向へ移動するときに該押出部材を解放して、少なくとも該クラッチ部材自体が停止するまでの間、該押出部材の該第2方向への移動を許容する、ように構成されたことを特長とする粘稠液体の押出装置。

【請求項2】 前記一方向クラッチ部材は、軸線に対して傾斜する切頭錐体状内面を備えて前記作動部材に連結される外筒と、該外筒の内側に配置され、前記押出部材を軸線方向移動可能に受容する軸線方向貫通孔及び該貫通孔に連通して径方向へ貫通する複数の空洞部を備えた内筒と、該内筒の該複数の空洞部のそれぞれに転動可能に収容される転動体とを具備し、該外筒の該切頭錐体状内面の拡張側が前記ハウジングに収容された前記容器に対向するように該ハウジング内に配置され、以て、前記一方向クラッチ部材が前記第1方向へ移動するときに、前記転動体が前記外筒の該切頭錐体状内面の収縮側で前記押出部材と該外筒との間に挟持されて、該クラッチ部材が該押出部材に係合し、該クラッチ部材が前記第2方向へ移動するときに、該転動体が該押出部材と該外筒との間で実質的に自由状態になって、該クラッチ部材が該押出部材を解放するように構成された請求項1に記載の粘稠液体の押出装置。

【請求項3】 前記押出部材は、前記内筒の前記軸線方向貫通孔に受容される軸棒を備え、該軸棒が、同一円筒面上に周方向へ等間隔に配置される複数の円弧周面と、それら円弧周面を相互に連結する複数の平周面とを備える請求項2に記載の粘稠液体の押出装置。

【請求項4】 前記押出部材の軸線方向移動を摩擦力により制動する制動部材をさらに備えた請求項1～3のいずれか1項に記載の粘稠液体の押出装置。

【発明の詳細な説明】

## 【0001】

【発明の属する技術分野】本発明は、接着剤、シーラント、コーキング材等の粘稠液体の押出装置に関し、特に、粘稠液体を封入した容器を変形させてノズルから粘稠液体を押し出す押出部材を備えた手動式の押出装置に関する。

## 【0002】

【従来の技術】例えば、構造物の継目に防水、耐候、防塵等の目的で適用されるシーラントやコーキング材、独立した物体を相互に固着するホットメルト接着剤等の接着剤、等の高い粘度を有する液体材料すなわち粘稠液体を、対象物表面に塗着する際には、粘稠液体を封入した容器をハウジングに収容し、手動式又は電気、油圧、空圧等の動力式に作動可能な押出部材により容器を圧縮変形させて、ノズルから所望量の粘稠液体を押し出す押出装置が広く使用されている。

【0003】特に手動式の押出装置では、押出部材を作動するために、手動操作可能な引金式、釦式等の作動部材が、押出部材に連動可能にハウジングに設けられている。そして、一般に作業者が片手でハウジングを担持しつつ指で作動部材を操作すると、1回の操作で、押出部材がハウジング内で容器に接近する方向へ所定距離だけ前進し、容器を所定寸法だけ圧縮して、所定量の粘稠液体をノズルから押し出すようになっている。

【0004】作動部材の操作を解除する（すなわち作動部材から指を離す）と、作動部材は押出部材から独立して、例えばばね等の付勢作用により初期位置に復帰する。このとき、押出部材が自由運動可能な状態にあれば、圧縮された容器内の粘稠液体の内圧（例えば粘稠液体に含まれる気泡等に起因する）により粘稠液体及び容器が膨張し、押出部材が初期位置に向かって押し戻される傾向がある。ここで、押出部材が例えば慣性により粘稠液体の膨張量を超えて押し戻されると、それに伴い容器内にノズルから空気が侵入して粘稠液体に巻き込まれ、次の塗着作業に際して、作動部材の指操作ストロークに無駄が生じて1回の操作で所定量の粘稠液体を押し出すことが困難になったり、押し出された粘稠液体に巻き込み空気によるむらが生じたりする問題があった。

【0005】そこで、従来の手動式の押出装置では、作動部材の操作時に容器を圧縮する方向への押出部材の移動を許容する一方で、作動部材の操作解除時に初期位置に復帰する方向への押出部材の移動を係止するロック手段、すなわち一方向クラッチ手段が設けられていた（例えば実開昭57-95266号公報、実開昭63-90476号公報参照）。

## 【0006】

【発明が解決しようとする課題】ところが、一方向クラッチ手段により、作動部材の操作解除時に押出部材の復帰方向への移動を係止すると、圧縮された容器内の粘稠液体の内圧により、ノズルから粘稠液体が漏出する問題



が生じる。漏出した粘稠液体は、塗着対象物を汚損したり、塵埃の付着により粘稠液体自体のシール能力や接着能力を低下させたりする危険がある。このような漏出を防止するために、従来の手動式押出装置では、作動部材の操作を解除した直後に一方向クラッチ手段の復帰移動係止作用を一時的に解除し、ノズルからの侵入空気が粘稠液体に巻き込まれない程度に容器の膨張を許容する方法が、便宜的に行われていた。しかしながらこのような方法は、経験に基づく判断のもとで正確な操作タイミングを必要とするので、作業者に熟練を課すことになっていた。

【0007】本発明の目的は、作動部材の操作解除後にノズルから粘稠液体が漏出することを、熟練を要さず容易に防止でき、しかも安価に製造できる操作性に優れた粘稠液体の手動式押出装置を提供することにある。

【0008】

【課題を解決するための手段】上記目的を達成するために、本発明は、粘稠液体を封入した容器を収容するハウジングと、ハウジングの一端で容器に連結されるノズルと、ハウジングの他端に軸線方向移動可能に支持され、一端に向かう第1方向へ移動したときに容器を変形してノズルから粘稠液体を押し出す押出部材と、押出部材に係合可能にハウジングに装備され、押出部材の第1方向への移動を許容するとともに他端に向かう第2方向への移動を制限する一方向クラッチ手段と、ハウジングに装備され、手動操作により押出部材を第1方向へ移動させる作動部材とを具備した粘稠液体の押出装置において、一方向クラッチ手段は、押出部材と作動部材との間に機能的に介在され、作動部材に連動して、ハウジング内で押出部材の移動方向に平行な第1及び第2方向へ選択的に移動可能な一方向クラッチ部材からなり、一方向クラッチ部材が、第1方向へ移動するときに押出部材に係合して、押出部材を第1方向へ移動させるとともに、第2方向へ移動するときに押出部材を解放して、少なくともクラッチ部材自体が停止するまでの間、押出部材の第2方向への移動を許容するように構成されたことを特長とする粘稠液体の押出装置を提供する。

【0009】さらに本発明は、上記した粘稠液体の押出装置において、一方向クラッチ部材は、軸線に対して傾斜する切頭錐体状内面を備えて作動部材に連結される外筒と、外筒の内側に配置され、押出部材を軸線方向移動可能に受容する軸線方向貫通孔及び貫通孔に連通して径方向へ貫通する複数の空洞部を備えた内筒と、内筒の複数の空洞部のそれぞれに転動可能に収容される転動体とを具備し、外筒の切頭錐体状内面の拡張側がハウジングに収容された容器に対向するようにハウジング内に配置され、以て、一方向クラッチ部材が第1方向へ移動するときに、転動体が外筒の切頭錐体状内面の収縮側で押出部材と外筒との間に挟持されて、クラッチ部材が押出部材に係合し、クラッチ部材が第2方向へ移動するとき

に、転動体が押出部材と外筒との間で実質的に自由状態になって、クラッチ部材が押出部材を解放するように構成された押出装置を提供する。

【0010】さらに本発明は、上記した粘稠液体の押出装置において、押出部材は、内筒の軸線方向貫通孔に受容される軸棒を備え、軸棒が、同一円筒面上に周方向へ等間隔に配置される複数の円弧周面と、それら円弧周面を相互に連結する複数の平周面とを備える押出装置を提供する。さらに本発明は、上記した粘稠液体の押出装置において、押出部材の軸線方向移動を摩擦力により制動する制動部材をさらに備えた押出装置を提供する。

【0011】

【発明の実施の形態】以下、添付図面を参照して、本発明をその好適な実施の形態に基づき詳細に説明する。図面において、同一又は類似の構成要素には共通の参照符号を付す。図面を参照すると、図1は本発明の一実施形態による粘稠液体の押出装置10を示す。押出装置10は、中空筒状の本体部分12と、本体部分12から側方へ延長される中空のグリップ部分14とから本質的に構成されたハウジング16を備える。ハウジング16の本体部分12には、粘稠液体Vを封入した筒状の容器18が着脱可能に収容される。容器18は、本体部分12に連結された支壁20を介して所定位置に支持される。

【0012】容器18は、全体に例えばアルミニウム等の金属材料から形成され、内圧の変化では容易には変形しない強度を付与されたカップ状周壁22と、カップ状周壁22の内周面に液密式摺動可能に装着される可動端壁24とを備える。可動端壁24は、カップ状周壁22の開口側を封鎖して、容積可変の液体封入空間を容器18内に画成する。

【0013】カップ状周壁22の底端（図で左端）には、例えばバルブ26を介して、液体封入空間に液体流通可能に連通されたノズル28が設置される。ノズル28は、容器18内に封入した粘稠液体Vを所定塗幅で吐出できるようになっている。容器18は、ハウジング16の本体部分12の一端12aに設けた穴30からノズル28を外部に突出させた状態で、本体部分12に収容される。

【0014】容器18に最大体積の粘稠液体Vが封入されているときには、可動端壁24はカップ状周壁22の開口端22a近傍に配置され、その位置から可動端壁24を周壁22に沿って容器18内に押し込むことにより、粘稠液体Vがノズル28から押し出される。したがって粘稠液体Vの吐出量は、可動端壁24の移動量に比例する。

【0015】容器18に封入される粘稠液体Vは、例えばポリ酢酸ビニル等からなるホットメルト接着剤や、シリコン系、ポリウレタン系、アクリル系等のシーラントのような、比較的高い粘度（例えばホットメルト接着剤（溶融時）で数千〜数万センチポアズ、シーラントで

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数十万センチポアズ)を有するものである。押出装置10をホットメルト接着剤の塗着装置として使用する場合には、例えば面状発熱体等の加熱構造を容器18のカップ状周壁22の外面に装備して、容器18を外側から加熱して接着剤を溶融しつつ塗着できるようにすることが望ましい。

【0016】なお押出装置10は、このような構造の容器に限らず、例えば可撓性の袋状容器等、様々な形態の容器を使用できる。また、ハウジング16の本体部分12の一端12aに予めノズルを設置しておき、容器を本体部分12の所定位置に収容したときに容器内部とノズルとが連通されるような構成とすることもできる。

【0017】ハウジング16の本体部分12の他端12bには、他端12bを揺動式に開閉可能な蓋部材32が装着される。蓋部材32は、ハウジング16の一部を構成すべく、ヒンジ34を介して本体部分12に連結される。蓋部材32は、図示の閉鎖位置では、後述する押出部材36による押出作業を可能にする一方で、図示しない開放位置では、容器18の着脱及び交換を可能にする。

【0018】押出部材36は、蓋部材32に設けた貫通孔38に軸線方向移動可能に受容支持される軸棒40と、軸棒40の一端に固定され、軸線に略直交する押圧面42を有する押出板44と、軸棒40の他端に形成されるハンドル46とを備える。押出部材36及び貫通孔38は、蓋部材32が図示の閉鎖位置にあるときに、軸棒40が本体部分12に収容された容器18と略同心に配置されるように、蓋部材32上で位置決めされる。また軸棒40は、ハンドル46を蓋部材32に係合させることなく、容器18内の粘稠液体Vを略完全に押し出す位置まで押出板44を移動できるだけの長さを有する。

【0019】さらに軸棒40は、同一円筒面上に周方向へ等間隔に配置される4つの円弧周面40aと、それら円弧周面40aを相互に連結する4つの平周面40bとを備えることが好ましい。このような軸棒40の周面形状は、後述する一方向クラッチ部材74の係止作用を意図的に解除できるようにするためのものであり、これについては後に詳述する。

【0020】蓋部材32の貫通孔38には、側方に凹部48が連通形成され、凹部48内に制動部材50が配置される。制動部材50は、ばね52により凹部48から突出する方向へ付勢され、貫通孔38に受容された軸棒40の表面に常に接触して、所定の摩擦力で軸棒40の移動を制動する。押出部材36は、軸棒40の軸線に沿って押出板44がハウジング本体部分12の一端12aに向かう方向(以下、第1方向(図1に矢印Aで示す)と称する)へ移動するときに、押圧面42が容器18の可動端壁24に当接されて、押出板44が可動端壁24を周壁22に沿って容器18内に押し込み、それによりノズル28から粘稠液体Vを押し出すように作用する。

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【0021】押出装置10は、手動操作により押出部材36を第1方向Aへ移動させるための作動部材54を備える。作動部材54は、ハウジング16のグリップ部分14に隣接して、支軸56に関し揺動可能に本体部分12に取着される引金58と、基端で支軸60により引金58に枢着され、本体部分12に設けたガイド62に沿って直線状に移動可能なリンク64と、蓋部材32に支軸66に関し揺動可能に取着され、リンク64の自由端64aに係合可能な位置に一端の爪68を配置するレバー70と、レバー70と蓋部材32との間に設置され、爪68がリンク64の自由端64aに接近する方向へレバー70を回動付勢するばね72とを備える。支軸56、60、66は、互いに平行に配置される。なお、引金58とハウジング16との間には、リンク64の自由端64aがレバー70の爪68から離れる方向へ引金58を回動付勢するばね等の付勢手段をさらに設けることもできる。

【0022】作業者は、片手でグリップ部分14を担持して所望の指を引金58に掛け、図1に示す初期位置

(休止位置)から図2に示す作用位置まで引金58を引き絞る(操作する)ことにより、リンク64の自由端64aをレバー70の爪68に係合させ、ばね72の付勢に抗してレバー70を図で反時計方向へ揺動させることができる(操作時の各構成要素の移動方向を図2に矢印で示す)。作業者が引金58から指を離す(操作解除する)と、ばね72の付勢によりレバー70が図の時計方向へ揺動し、レバー70、リンク64及び引金58が、図1の初期位置に復帰する。

【0023】さらに押出装置10は、押出部材36の第1方向Aへの移動を許容する一方で、押出部材36の初期位置に復帰する方向すなわちハウジング本体部分12の他端12bに向かう方向(以下、第2方向(図1に矢印Bで示す)と称する)への移動を制限する一方向クラッチ手段として、一方向クラッチ部材74を備える。一方向クラッチ部材74は、図3及び図4に示すように、レバー70の他端に支軸76を介して枢着される外筒78と、外筒78に収容される筒状部分80及び筒状部分80の軸方向一端で径方向へ延設されるフランジ部分82を有した内筒84と、内筒84の筒状部分80に形成された4つの空洞部86のそれぞれに転動可能に収容される球状の転動体88と、フランジ部分82の反対側で内筒84に例えばボルト(図示せず)により固定され、フランジ部分82との間に外筒78を固定的に挟持する端板90とを備える。支軸76は、支軸56、60、66に平行に配置される。

【0024】外筒78は、内筒84の筒状部分80に対向する内面92が、軸線に対して傾斜する切頭錐体(円錐台又は角錐台)状の表面として形成される。好ましくは外筒78の切頭錐体状内面92の収縮側(円錐台状内面の場合はその小径側)の端縁は、内筒84のフランジ



部分82に隣接する筒状部分80の表面に当接され、外筒78と内筒84との間のがたつきが防止される。内筒84及び端板90には、押出部材36の軸棒40を軸線方向移動可能及び回転可能に受容する円筒状の軸線方向貫通孔94、96がそれぞれ形成される。また、内筒84の各空洞部86は、軸線に平行な平面に関して長円形断面を有し、周方向等間隔位置で筒状部分80に径方向へ貫通形成されて、それぞれ軸線方向貫通孔94に連通される。

【0025】したがって、組立てた一方向クラッチ部材74を軸棒40に装着すると、内筒84の複数の空洞部86に、径方向寸法が端板90側から内筒84のフランジ部分82側へ徐々に減少する長円形断面の空間S（図5）が画成され、それら空間S内に転動体88が転動可能に収容される。ここで、軸棒40の各円弧周面40aを各空洞部86に対応配置したときには、各空間Sを画成する軸棒40の円弧周面40aと外筒78の内面92との間の距離は、端板90に近接した側（すなわち切頭錐体状内面92の拡張側）で各転動体88の直径よりも僅かに大きく設定され、フランジ部分82に近接した側（すなわち切頭錐体状内面92の収縮側）で各転動体88の直径よりも僅かに小さく設定される。また、軸棒40を回転して各平周面40bを各空洞部86に対応配置したときには、各空間Sを画成する軸棒40の平周面40bと外筒78の内面92との間の距離は、フランジ部分82に近接した側でも各転動体88の直径よりも僅かに大きく設定される。

【0026】このような構成を有する一方向クラッチ部材74では、軸棒40の各円弧周面40aを各空洞部86に対応配置した状態で、内筒84の貫通孔94に受容された軸棒40が端板90からフランジ部分82に向かう方向へ内筒84に対して移動すると、各転動体88が、各空間S内で転動してフランジ部分82に近接した側に移動し、軸棒40の各円弧周面40aと外筒78の内面92との間に固定的に挟持される（図5（a）、

（b）参照）。その結果、クラッチ部材74に対する軸棒40の、端板90からフランジ部分82に向かう方向への移動が係止される。

【0027】これに対し、軸棒40の各円弧周面40aを各空洞部86に対応配置した状態で、内筒84の貫通孔94に受容された軸棒40がフランジ部分82から端板90に向かう方向へ内筒84に対して移動すると、各転動体88が、各空間S内で転動して端板90に近接した側に移動し、軸棒40の各円弧周面40aと外筒78の内面92との間で自由に運動できるようになる（図6参照）。その結果、クラッチ部材74に対する軸棒40の、フランジ部分82から端板90に向かう方向への移動が自由となる。

【0028】さらに、軸棒40の各平周面40bを各空洞部86に対応配置した状態では、軸棒40の移動方向

に関わらず各転動体88が各空間S内で自由に運動する。その結果、軸棒40はクラッチ部材74に対し、フランジ部分82及び端板90のいずれに向かう方向へも自由に移動できる（図7（a）、（b）参照）。

【0029】なお、外筒78の内面92の軸線に対する傾斜角度は、好ましくは $10^{\circ} \sim 30^{\circ}$ である。この場合、空洞部86の軸線方向寸法は、図示のように転動体88よりもかなり大きく設定する必要はなく、理論的にはクラッチ解除時（図6及び図7）にごく微小な隙間が軸棒40の周面40a、40bと転動体88と外筒78の内面92との間に形成されさえすれば、上記のような一方向クラッチ部材74の作用が得られる。動力伝達要素として好ましい外筒78及び内筒84の材料は、ステンレス鋼等の機械的強度に優れた材料である。また、軸棒40及び転動体88は、焼入れ鋼からなることが好ましい。端板90は、軽量化のため、アルミニウム等の軽量材料からなることが好ましい。或いは、外筒、内筒及び端板を同一材料から一体的に形成してなる一方向クラッチ部材を使用することもできる。

【0030】一方向クラッチ部材74は、押出部材36の押出板44が端板90側に配置されるように、軸棒40に装着される。したがって一方向クラッチ部材74は、端板90をハウジング16の一端12a側（すなわち容器18側）に向けて、レバー70を介して蓋部材32内に移動可能に設置される（図1参照）。好ましくは蓋部材32には、一方向クラッチ部材74を軸棒40の軸線方向へ案内するガイド（図示せず）が設けられ、レバー70が支軸66に関して揺動する際に、一方向クラッチ部材74が軸棒40に平行に、第1方向A及び第2方向Bへ移動できるようになっている。

【0031】上記構成を有する押出装置10の作用を、以下に説明する。まず、押出部材36のハンドル46を操作して、軸棒40の各円弧周面40aが一方向クラッチ部材74の各空洞部86に対応配置する位置に、押出部材36を設定する。このとき、各円弧周面40aが各空洞部86に対応配置されたことを触感で感知できるとともに、その状態に押出部材36を保持できるような、ボールプランジャ等の保持構造（図示せず）を、例えば蓋部材32に設置することが望ましい。

【0032】次いで、図1の初期位置から作動部材54を操作して、引金58及びリンク64を介してレバー70を支軸66に関し反時計方向へ揺動させ、一方向クラッチ部材74を第1方向Aへ移動させる。このとき、軸棒40と一方向クラッチ部材74との相対移動方向は、上述した軸棒40が端板90からフランジ部分82に向かう方向となるので、一方向クラッチ部材74において各転動体88が軸棒40と外筒内面92との間に固定的に挟持され、軸棒40が一方向クラッチ部材74に係止される。その結果、押出部材36は、軸棒40に及ぼす制動部材50の摩擦力に抗して、一方向クラッチ部材7

4と共に第1方向Aへ移動する。

【0033】ここで押出部材36すなわち押出板44の第1方向Aへの移動距離は、引金58を引き絞る長さによって決まり、それによって容器18の可動端板24が移動して、所定量の粘稠液体Vがノズル28から押し出される(図2)。引金58を引き絞る長さは、例えばハウジング16の本体部分12に設けたガイド62に、リンク64が初期位置から所定距離移動したときにリンク64に係合するストッパの機能を付与すれば、ガイド62の位置を変更することによって適宜調整できる。

【0034】図2の作用位置から作動部材54の操作を解除すると、ばね72の付勢によりレバー70が軸棒66に関して時計方向へ揺動し、一方向クラッチ部材74が第2方向Bへ移動する。このとき、押出部材36の軸棒40は制動部材50により所定の摩擦力で制動されているので、軸棒40と一方向クラッチ部材74との間に、上述した軸棒40がフランジ部分82から端板90に向かう方向への相対移動が生じ、各転動体88が軸棒40と外筒内面92との間で自由になり、軸棒40が一方向クラッチ部材74から解放される。その結果、一方向クラッチ部材74は、押出部材36から独立して第2方向Bへ移動し、初期位置に復帰する。

【0035】このようにして、作動部材54の1回の操作で所定量の粘稠液体Vがノズル28から押し出され、次の操作に備えて作動部材54及び一方向クラッチ部材74が初期位置に復帰する。押出部材36による押出作用が解除される(つまり粘稠液体Vに加わる外圧が排除される)と、容器18内では粘稠液体Vがそれ自体の内圧により膨張することが予測される。本発明に係る押出装置10では、粘稠液体Vの膨張により可動端板24を介して押出部材36が第2方向Bへ押し戻されることを、下記のように自動的に許容する構成としたので、粘稠液体Vが内圧により膨張したときにもノズル28から漏出することは効果的に防止される。

【0036】すなわち、一方向クラッチ部材74が第2方向Bへ移動している最中は、軸棒40が上記したように一方向クラッチ部材74から解放されるので、押出部材36は、可動端板24から受ける力と制動部材50の摩擦力とによって軸線方向移動を制御される。したがって、粘稠液体Vの膨張により可動端板24に加わる力が制動部材50の摩擦力を上回ると、押出部材36は自動的に第2方向Bへ移動することになる。

【0037】押出部材36と一方向クラッチ部材74との相対動作を説明すると、押出部材36は一方向クラッチ部材74に対し、常に第1方向Aに移動可能であるが、第2方向Bへは実質的に移動できない。ここで「実質的」と述べたのは、一方向クラッチ部材74の空洞部86内で転動体88が図6の自由位置から図5の挟持位置まで移動する間に、空洞部86の軸線方向寸法に対応して押出部材36の第2方向Bへの微小な移動が許容さ

れることを説明したものである。

【0038】したがって、一方向クラッチ部材74が第2方向Bへ移動している間は、通常、粘稠液体Vの膨張による押出部材36の移動速度が一方向クラッチ部材74の移動速度より遅いので、押出部材36は一方向クラッチ部材74に対し第1方向Aに相対移動しつつ、押出装置10内で第2方向Bへ移動する。そして、一方向クラッチ部材74が図1の初期位置に到達して停止したとき、粘稠液体Vの膨張が継続している場合は、転動体88が図6の自由位置から図5の挟持位置まで移動する僅かな時間を経て、押出部材36が一方向クラッチ部材74によって係止される。このようにして、作動部材54の操作解除後に粘稠液体Vの膨張に起因したノズル28からの漏出が低減され又は防止されるとともに、ノズル28からの侵入空気の粘稠液体Vへの巻き込みが防止される。一方向クラッチ部材74の停止時に粘稠液体Vの膨張が既に終息している場合は、押出部材36の第2方向Bへの付加的な移動が一方向クラッチ部材74によって係止される。その結果、ノズル28からの侵入空気の粘稠液体Vへの巻き込みが防止される。

【0039】また、例えば作業者が引金58を解放する手指の操作速度を調整する等により、一方向クラッチ部材74の移動速度を押出部材36の移動速度に略等しく制御したときには、押出部材36は一方向クラッチ部材74と一体的に第2方向Bへ移動する。そして通常は、一方向クラッチ部材74が図1の初期位置に到達する前に粘稠液体Vの膨張が終息し、一方向クラッチ部材74が初期位置で停止したときに、押出部材36の第2方向Bへの付加的な移動が一方向クラッチ部材74によって防止される。このようにして、作動部材54の操作解除後に粘稠液体Vの膨張に起因したノズル28からの漏出が防止されるとともに、ノズル28からの侵入空気の粘稠液体Vへの巻き込みが防止される。

【0040】このように、作動部材54の操作解除後に、押出部材36が第2方向Bへ移動できる時間は、一方向クラッチ部材74が作用位置から初期位置まで移動するに要する時間によって制限される。また、押出部材36が第2方向Bへ移動できる距離は、一方向クラッチ部材74の作用位置から初期位置までの移動距離及び移動時間によって制限される。そこで押出装置10では、作動部材54の操作解除後に、予測される粘稠液体Vの膨張により粘稠液体Vがノズル28から漏出することなく可動端板24を移動できる程度に、また粘稠液体Vの膨張終息後の押出部材36の付加的な第2方向Bへの移動を防止できる程度に、一方向クラッチ部材74の第2方向Bへの移動速度、及び軸棒40に対する制動部材50の摩擦力を調整しさえすれば、作業者が何らの特別な(熟練を要する)操作を行うことなく、自動的にノズル28からの粘稠液体Vの漏出を低減又は防止できる。

【0041】なお押出装置10では、ノズル28からの



粘稠液体Vの漏出を効果的に防止するために、一方向クラッチ部材74から解放された押出部材36は、軸線方向へ可及的に自由に移動できることが好ましい。したがって制動部材50により軸棒40に加わる摩擦力は、作動部材54の操作解除時に軸棒40を一方向クラッチ部材74から容易に解放できる範囲で、可及的に小さいことが望ましい。また同じ理由で、一方向クラッチ部材74の第2方向Bへの移動速度は、粘稠液体Vの膨張に起因した可動端板24及び押出部材36の第2方向Bへの移動速度よりも大きいことが好ましい。

【0042】上記したように押出部材36は、粘稠液体Vの膨張が所定量生じた後、常時作用している制動部材50の摩擦力、及び最終的に一方向クラッチ部材74の作用により停止する。このとき容器18内の粘稠液体Vは、外力の影響を受けることなく自然に膨張しているので、ノズル28から空気を侵入させず、次の押し出し作業で直ちにノズル28から適正に押し出される状態になっている。そこで、再び作動部材54を操作して、一方向クラッチ部材74を介して押出部材36を第1方向Aへ移動させると、作動部材54の操作に実質的にロスを生じることなく、押出部材36の移動起点から直ちに粘稠液体Vに押出圧力が加わり、所定量の粘稠液体Vがノズル28から正確に押し出される。

【0043】このようにして、作動部材54の操作（引金58の引き絞り）を繰り返すことにより、1回の操作で所定量ずつ、容器18内の粘稠液体Vを略完全に押し出すことができる。作動部材54の操作が不能になった時点で、容器18が空になったことが感知される。そこで作業者は、押出部材36のハンドル46を操作して軸棒40を約45°回転させ、軸棒40の各平周面40bが一方向クラッチ部材74の各空洞部86に対応配置する位置に、押出部材36を設定する。それにより押出部材36は、一方向クラッチ部材74から独立して、第1方向A及び第2方向Bのいずれの方向にも移動できるようになる。そこで押出部材36を、押出板44が蓋部材32に最も近接する位置まで移動すれば、ヒンジ34に関して蓋部材32を回動し、ハウジング16の本体部分12の他端12bを開放することが可能となる。それにより、使用済の容器18をハウジング16から取り出して、新しいものに交換することができる。

【0044】なお、押出部材36の軸棒40の周面形状は、上記のように容器18の着脱及び交換を可能にするためのものである。したがって、例えば蓋部材32をハウジング16の本体部分12から分離できるようにする等、容器18の着脱及び交換を可能にする他の手段を設けた場合には、略円筒状の軸棒を使用することができるのは、言うまでもない。また、一方向クラッチ部材74の外筒78の外周面及び内面92並びに内筒84の筒状部分80の外周面は、図示のような円形断面の形状に限らず、多角形や楕円形断面を有する形状とすることもでき

る。

【0045】

【発明の効果】以上の説明から明らかなように、本発明は、押出部材の軸線方向移動を制御する一方向クラッチ部材が、ハウジング内で作動部材に連動して軸線方向移動可能であり、第1方向へ移動するときに押出部材に係合し、押出部材により容器を変形させて粘稠液体を押し出すとともに、第2方向へ移動するときに押出部材を解放し、一方向クラッチ部材自体が停止するまでの間、押出部材の第2方向への移動を許容するように構成したので、作動部材の操作解除後にノズルから粘稠液体が漏出することを、作業者のいかなる特別な操作をも必要とせず自動的に防止することが可能となった。したがって本発明によれば、作動部材の操作解除後にノズルからの粘稠液体の漏出を作業者の熟練を要さず容易に防止でき、しかも安価に製造できる操作性に優れた粘稠液体の手動式押出装置が提供される。

【図面の簡単な説明】

【図1】本発明の一実施形態による粘稠液体の押出装置の断面側面図で、作動部材が初期位置にある状態を示す。

【図2】図1の押出装置の断面側面図で、作動部材が作用位置にある状態を示す。

【図3】図1の押出装置に使用される一方向クラッチ部材の分解斜視図である。

【図4】組立時の図3の一方向クラッチ部材を切り欠いて示す斜視図である。

【図5】図3の一方向クラッチ部材の軸棒係止時の図で、(a)断面側面図、及び(b)線V-Vに沿った断面正面図、である。

【図6】図3の一方向クラッチ部材の軸棒解放時の断面側面図である。

【図7】図3の一方向クラッチ部材の軸棒解放時の図で、(a)断面側面図、及び(b)線VII-VIIに沿った断面正面図、である。

【符号の説明】

16…ハウジング

18…容器

24…可動端板

28…ノズル

32…蓋部材

36…押出部材

40…軸棒

44…押出板

46…ハンドル

50…制動部材

54…作動部材

58…引金

64…リンク

70…レバー

13

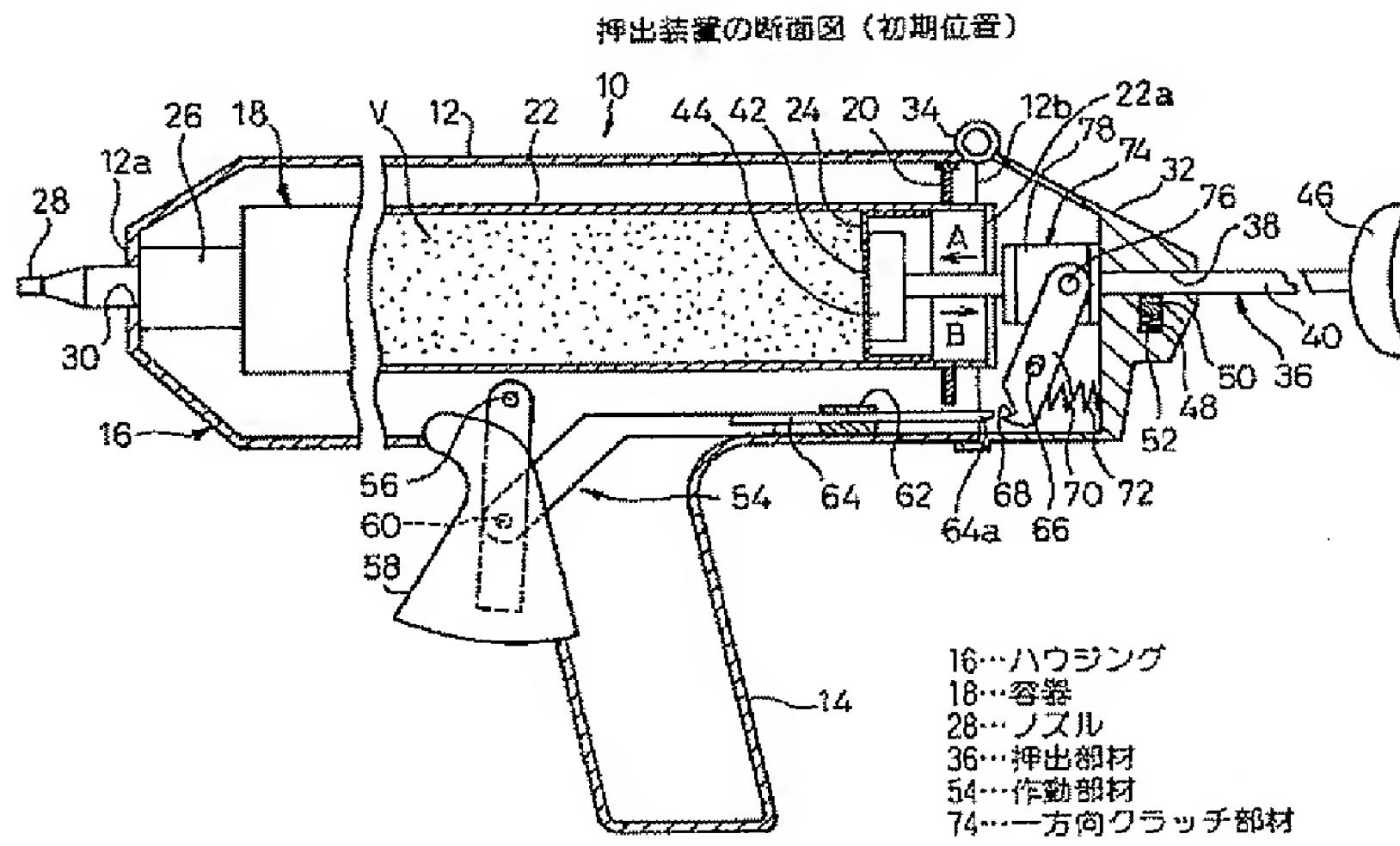
14

72…ばね  
74…一方方向クラッチ部材  
78…外筒

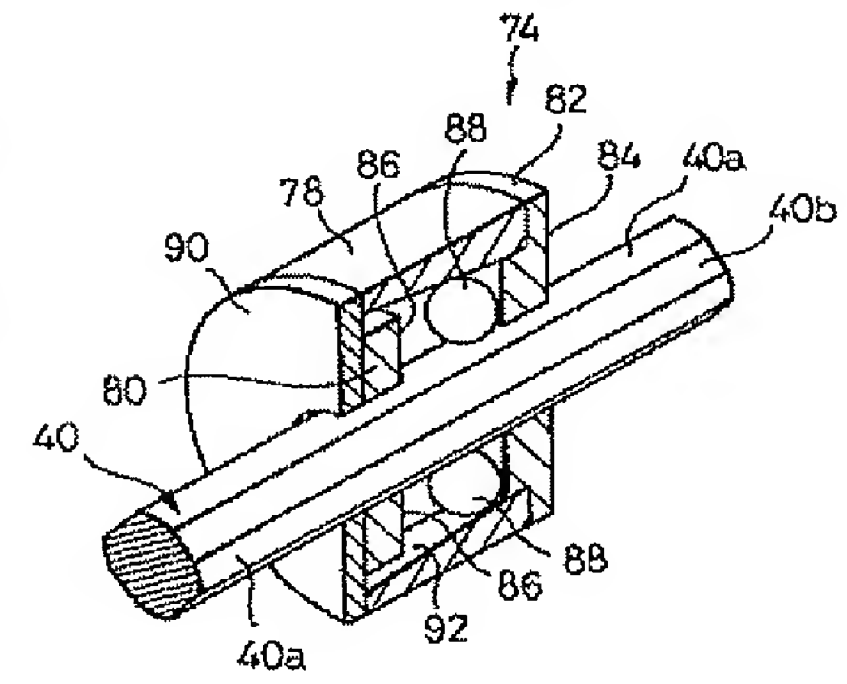
84…内筒  
88…転動体  
92…内面

【図1】

【図4】



一方方向クラッチ部材の切欠き斜視図

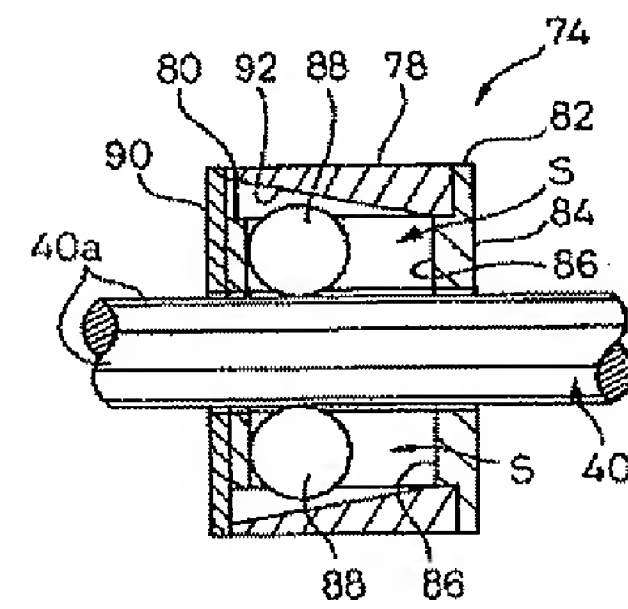
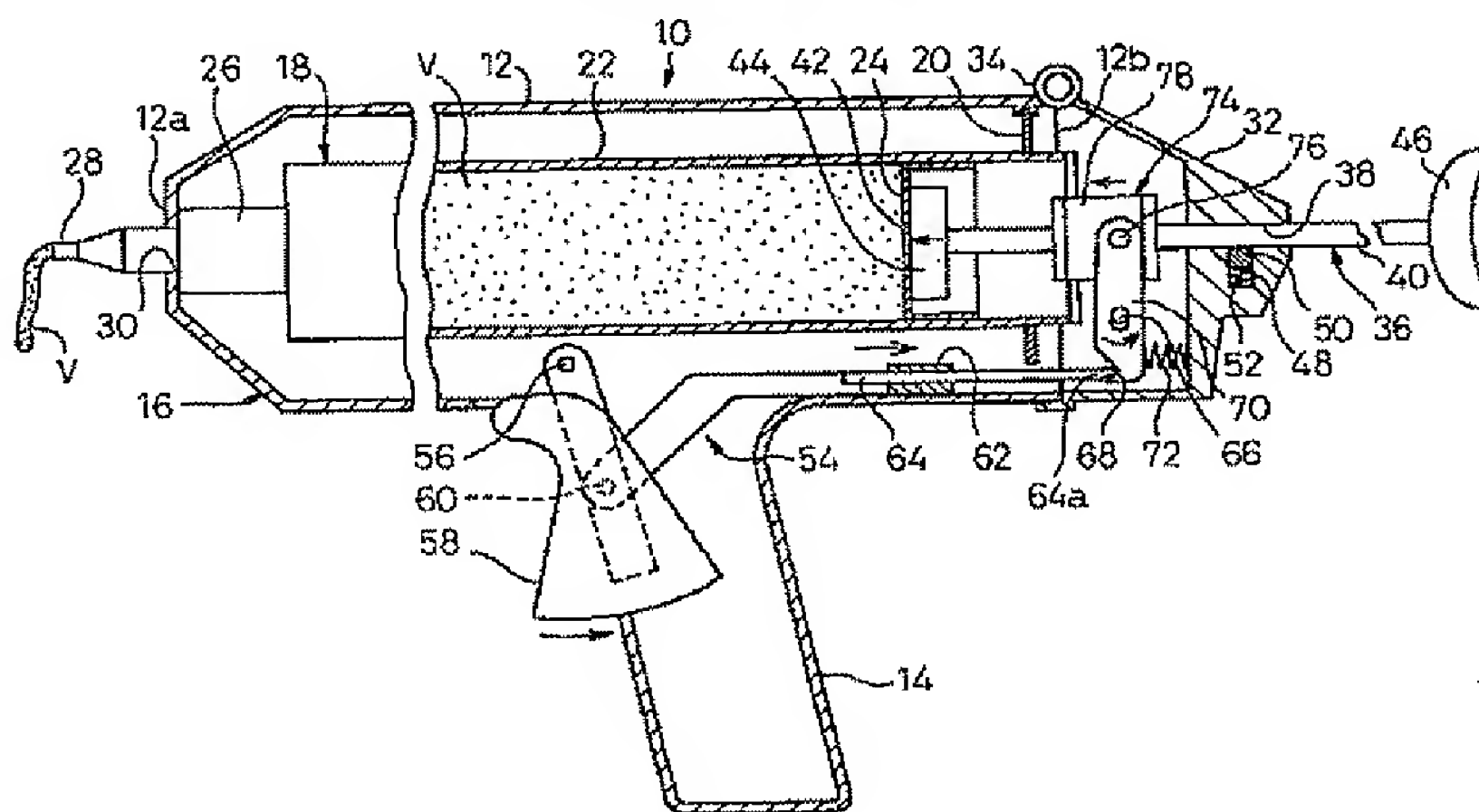


【図6】

一方方向クラッチ部材の作用説明図（解放時）

【図2】

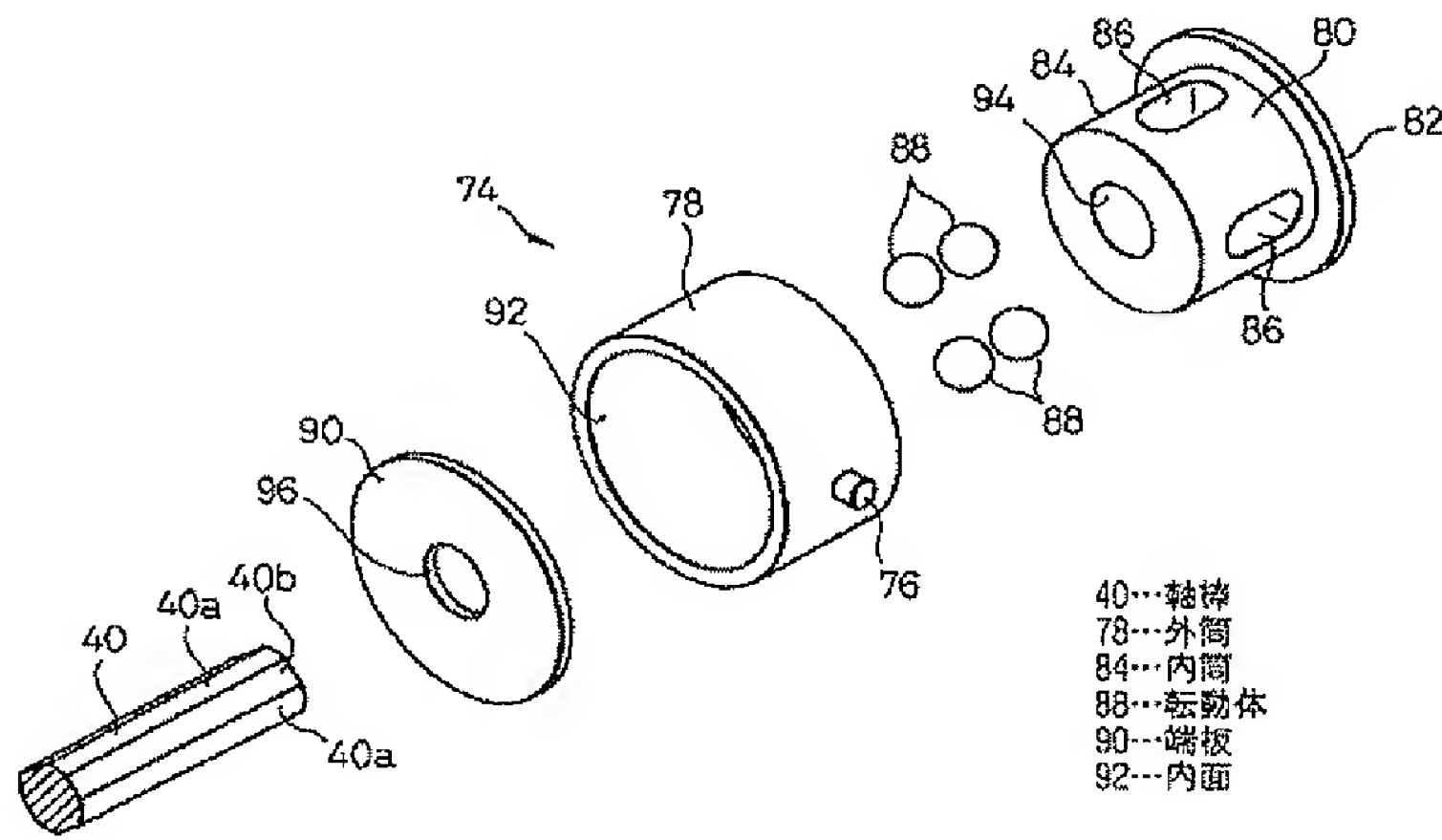
押出装置の断面図（作用位置）





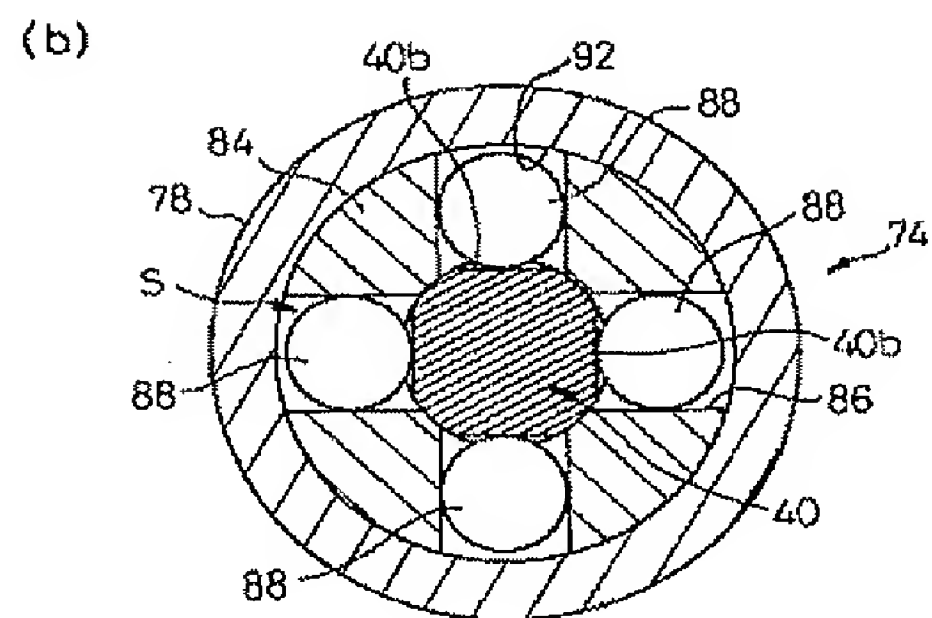
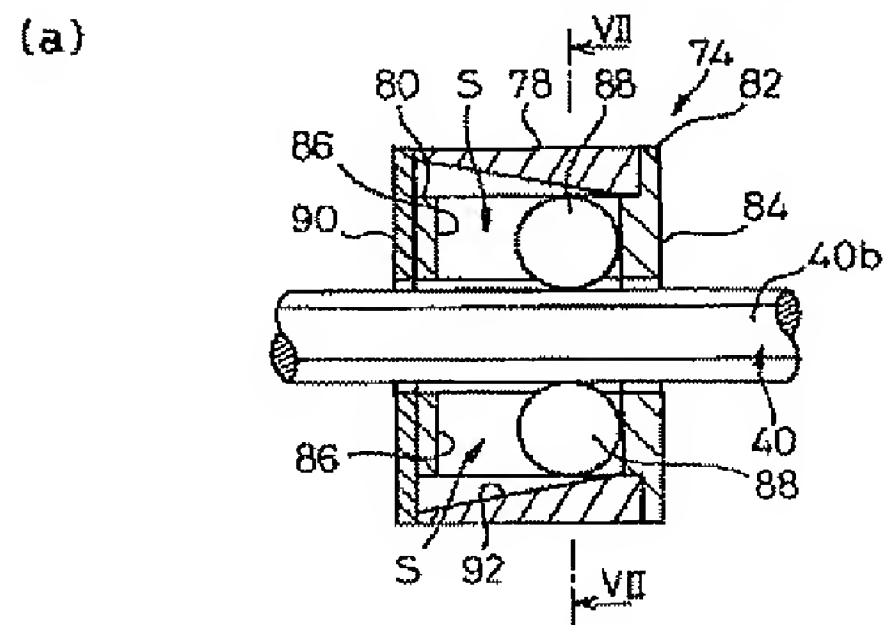
【図3】

一方向クラッチ部材の分解斜視図



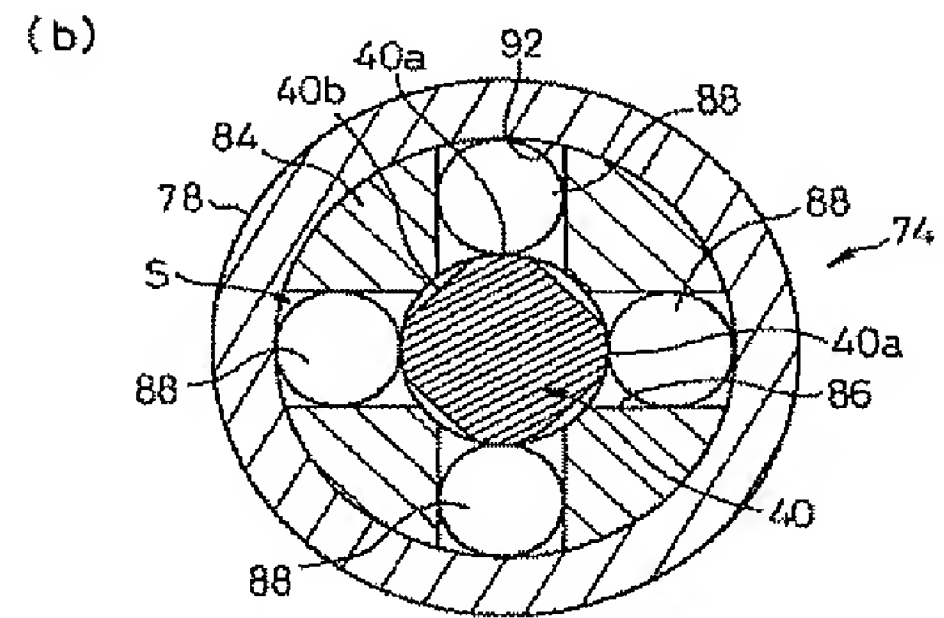
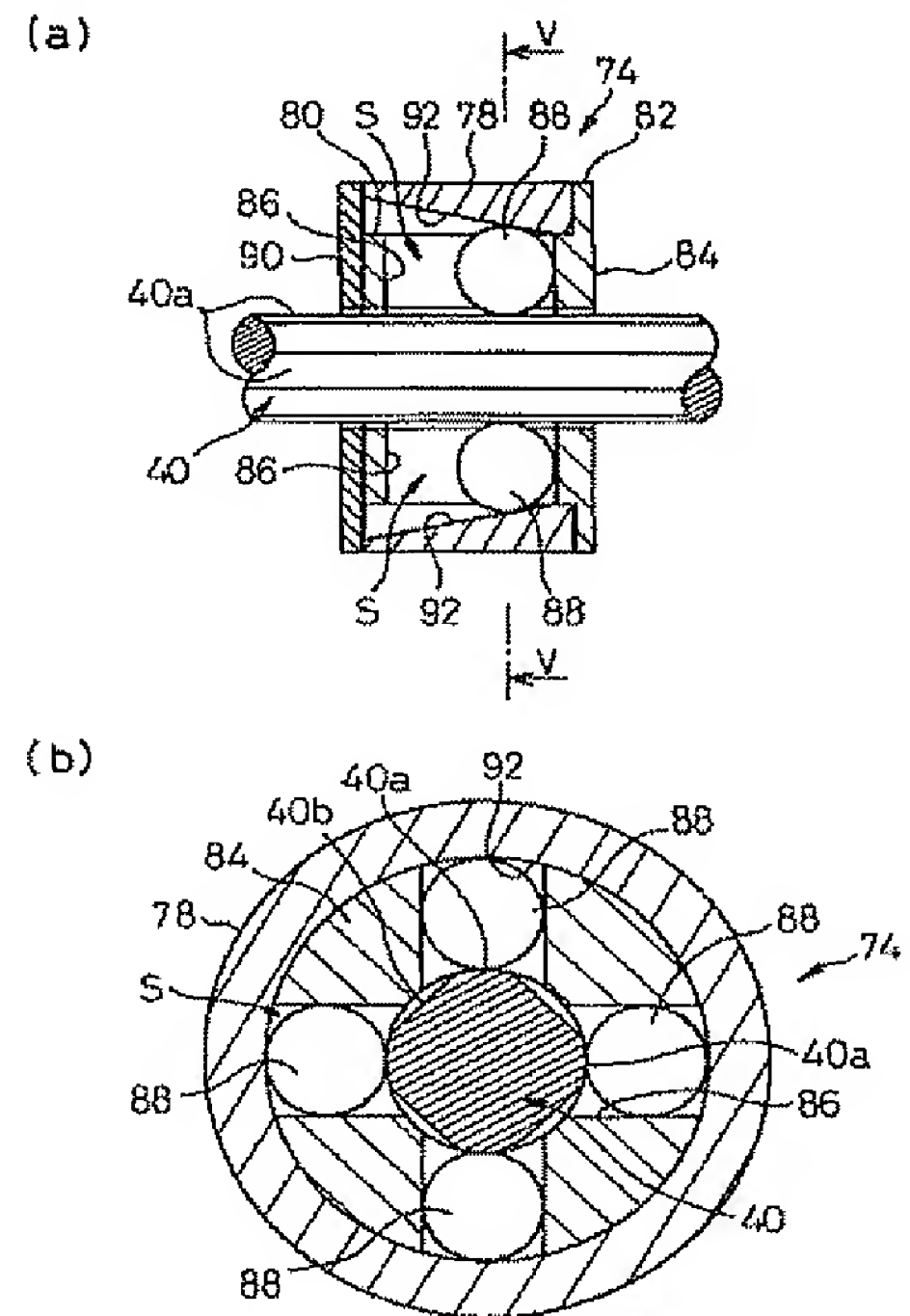
【図7】

一方向クラッチ部材の作用説明図（解放時）



【図5】

一方向クラッチ部材の作用説明図（係止時）



## CLAIMS

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### [Claim(s)]

[Claim 1]In equipment for launching of viscous liquid characterized by comprising the following, said one way clutch means, Intervene functionally between said extrusion member and said operation member, and this operation member is interlocked with, Consist of a movable one way clutch member selectively within said housing in said 1st and 2nd directions parallel to the move direction of this extrusion member, and when this one way clutch member moves in this 1st direction, it engages with this extrusion member, Equipment for launching of viscous liquid which makes the feature a thing which permit movement in this 2nd direction of this extrusion member, and which was constituted like until it releases this extrusion member and this clutch member itself stops at least when moving in this 2nd direction while moving this extrusion member in this 1st direction.

Housing which accommodates a container which enclosed viscous liquid.

A nozzle connected with this container by an end of this housing.

An extrusion member which is supported by the other end of said housing so that axis directional movement is possible, transforms said container when it moves in the 1st direction that goes to said one end, and extrudes viscous liquid from said nozzle.

A one way clutch means to restrict movement in the 2nd direction that goes to said other end while said housing is equipped so that engagement to this extrusion member is possible; and permitting movement in said 1st direction of this extrusion member, and an operation member with which said housing is equipped and which moves said extrusion member in said 1st direction by manual operation.

[Claim 2]An outer case which said one way clutch member is provided with a truncated cone-like inner surface which inclines to an axis, and is connected with said operation member, A container liner provided with two or more hollow parts which it is arranged inside this outer case, are opened for free passage to an axial direction breakthrough and this breakthrough which receive said extrusion member so that axis directional movement is possible, and are penetrated to a diameter direction, A rolling element accommodated in each of a hollow part of this plurality of this container liner so that rolling is possible is provided, When it is arranged in this housing so that the extension side of this truncated cone-like inner surface of this outer case may counter said container accommodated in said housing, with said one way clutch member moves in said 1st direction, When said rolling element is a contraction side of this truncated cone-like inner surface of said outer case, is pinched between said extrusion member and this outer case, this clutch member engages with this extrusion member and this clutch member moves in said 2nd direction, Equipment for launching of the viscous liquid according to claim 1 constituted so that this rolling element would be in a free state substantially between this extrusion member and this outer case and this clutch member might release this extrusion member.

[Claim 3]Equipment for launching of the viscous liquid according to claim 2 characterized by comprising the following.

Two or more circle peripheral surfaces by which said extrusion member is provided with a shaft received by said axial direction breakthrough of said container liner, and this shaft is arranged at equal intervals to a hoop direction at the same cylinder side top.



Two or more common peripheral surfaces which connect these circle peripheral surface mutually.

[Claim 4]Equipment for launching of viscous liquid given in any 1 paragraph of claims 1-3 further provided with a brake member which brakes axial direction movement of said extrusion member according to frictional force.

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[Translation done.]

## DETAILED DESCRIPTION

### [Detailed Description of the Invention]

[0001]

[Field of the Invention] Especially this invention relates to the equipment for launching of the manual type provided with the extrusion member which changes the container which enclosed viscous liquid about the equipment for launching of viscous liquid, such as adhesives, sealant, and a caulking material, and extrudes viscous liquid from a nozzle.

[0002]

[Description of the Prior Art] For example, the sealant and caulking material which are applied to the joint of a structure for the purpose, such as water proof, weatherability, and protection against dust, When plastering an object surface, the liquid material, i.e., the viscous liquid, which have high viscosity, such as adhesives, such as hot melt adhesive which adheres the independent object mutually, The container which enclosed viscous liquid is accommodated in housing, the compression set of the container is carried out by the extrusion member which can operate at a power ceremony, such as a manual type or electrical and electric equipment, oil pressure, and pneumatics, and the equipment for launching which extrudes the viscous liquid of desired quantity from a nozzle is used widely.

[0003] In order especially to operate an extrusion member with the equipment for launching of a manual type, operation members, such as a trigger type in which manual operation is possible, and a button type, are provided in housing so that linkage with an extrusion member is possible. And if an operation member is operated with a finger, a worker supporting housing with one hand generally, by one operation, only prescribed distance will advance in the direction which approaches a container within housing, only a prescribed dimension will compress a container, and an extrusion member will extrude the viscous liquid of the specified quantity from a nozzle.

[0004] operation of an operation member — canceling (that is, a finger is lifted from an operation member) — an operation member returns to an initial position by energization operation of a spring etc. independently from an extrusion member. If an extrusion member is in the state in which a free movement is possible at this time, viscous liquid and a container expand with the internal pressure (for example, it originates in the air bubbles etc. which are contained in viscous liquid) of the viscous liquid in the compressed container, and there is a tendency for an extrusion member to be put back toward an initial position. If an extrusion member is put back by inertia exceeding the expanding quantity of viscous liquid, here, In connection with it, air invades from a nozzle in a container, it is involved in viscous liquid, and the next application work is faced, There was a problem which it becomes difficult for utility to arise in the finger control stroke of an operation member, and to extrude the viscous liquid of the specified quantity by one operation, or is involved in the extruded viscous liquid and unevenness with air produces.

[0005] Then, while movement of an extrusion member in the direction which compresses a container at the time of operation of an operation member is permitted in the equipment for launching of the conventional manual type, A means for locking which stops movement of an extrusion member in the direction which returns to an initial position at the time of operation release of an operation member, i.e., a one way clutch means, was provided (for example, refer to JP,57-95266,U and JP,63-90476,U).



[0006]

[Problem(s) to be Solved by the Invention]However, if movement in the return direction of an extrusion member is stopped by a one way clutch means at the time of operation release of an operation member, the problem which viscous liquid leaks will arise from a nozzle with the internal pressure of the viscous liquid in the compressed container. The leaked viscous liquid has a fear of soiling an application subject or reducing the seal capacity and adhering capacity of viscous liquid itself by adhesion of dust. In order to prevent such a break through, in conventional manual type equipment for launching, the return movement locking action of the one way clutch means was temporarily canceled immediately after canceling operation of an operation member, and the method of permitting expansion of a container to such an extent that the invasion air from a nozzle is not involved in viscous liquid was performed for convenience. However, since such a method needed exact operation timing under the judgment based on experience, the worker was to be burdened with skill.

[0007]viscous liquid leaks the purpose of this invention from a nozzle after operation release of an operation member — skill — \*\*\*\*\* — it can prevent easily and is in providing the manual type equipment for launching of viscous liquid excellent in the operativity which can moreover be manufactured cheaply.

[0008]

[Means for Solving the Problem]To achieve the above objects, in equipment for launching of viscous liquid characterized by comprising the following, this invention a one way clutch means, Intervene functionally between an extrusion member and an operation member, and an operation member is interlocked with, Consist of a movable one way clutch member selectively within housing in the 1st and 2nd directions parallel to the move direction of an extrusion member, and when a one way clutch member moves in the 1st direction, it engages with an extrusion member, Equipment for launching of viscous liquid which makes it the feature to have been constituted so that movement in the 2nd direction of an extrusion member might be permitted until it released an extrusion member and the clutch member itself stopped at least when moving in the 2nd direction while moving an extrusion member in the 1st direction. Housing which accommodates a container which enclosed viscous liquid.

A nozzle connected with a container by an end of housing.

An extrusion member which is supported by the other end of housing so that axis directional movement is possible, transforms a container when it moves in the 1st direction that goes to one end, and extrudes viscous liquid from a nozzle.

A one way clutch means to restrict movement in the 2nd direction that goes to the other end while housing is equipped so that engagement to an extrusion member is possible, and permitting movement in the 1st direction of an extrusion member, and an operation member with which housing is equipped and which moves an extrusion member in the 1st direction by manual operation.

[0009]Furthermore in equipment for launching of the above-mentioned viscous liquid, this invention a one way clutch member, An outer case which is provided with a truncated cone-like inner surface which inclines to an axis, and is connected with an operation member, A container liner provided with two or more hollow parts which it is arranged inside an outer case, are opened for free passage to an axial direction breakthrough and a breakthrough which receive an extrusion member so that axis

directional movement is possible, and are penetrated to a diameter direction, A rolling element accommodated in each of two or more hollow parts of a container liner so that rolling is possible is provided, When it is arranged in housing so that the extension side of a truncated cone-like inner surface of an outer case may counter a container accommodated in housing, with a one way clutch member moves in the 1st direction, When a rolling element is a contraction side of a truncated cone-like inner surface of an outer case, is pinched between an extrusion member and an outer case, a clutch member engages with an extrusion member and a clutch member moves in the 2nd direction, A rolling element will be in a free state substantially between an extrusion member and an outer case, and equipment for launching constituted so that a clutch member might release an extrusion member is provided.

[0010]Equipment for launching of the above-mentioned viscous liquid whose this invention is furthermore characterized by that equipment for launching comprises the following.

Two or more circle peripheral surfaces by which an extrusion member is provided with a shaft received by axial direction breakthrough of a container liner, and a shaft is arranged at equal intervals to a hoop direction at the same cylinder side top.

Two or more common peripheral surfaces which connect these circle peripheral surface mutually.

Furthermore in equipment for launching of the above-mentioned viscous liquid, this invention provides equipment for launching further provided with a brake member which brakes axial direction movement of an extrusion member according to frictional force.

[0011]

[Embodiment of the Invention]Hereafter, with reference to an accompanying drawing, this invention is explained in detail based on the suitable embodiment. In a drawing, a common reference mark is given to an identical or similar component. When drawings are referred to, drawing 1 shows the equipment for launching 10 of the viscous liquid by one embodiment of this invention. The equipment for launching 10 is provided with the housing 16 which comprised intrinsically the hollow cylinder-like body part 12 and the grip part 14 of the hollow extended from the body part 12 to the side. The tubed container 18 which enclosed the viscous liquid V is accommodated in the body part 12 of the housing 16 removable. The container 18 is supported by the prescribed position via the support wall 20 connected with the body part 12.

[0012]The container 18 is provided with the following.

The cup shape peripheral wall 22 to which the intensity which is formed in the whole from metallic materials, such as aluminum, and does not change easily in change of internal pressure was given.

the inner skin of the cup shape peripheral wall 22 -- a fluid-tight type -- the movable end wall 24 with which it is equipped slidably.

The movable end wall 24 blocks the opening side of the cup shape peripheral wall 22, and forms variable capacity fluid enclosure space in the container 18.

[0013]The nozzle 28 opened for free passage by fluid enclosure space so that liquid circulation was possible is installed in the bottom edge (it is a left end with a figure) of the cup shape peripheral wall 22, for example via the valve 26. The nozzle 28 has come to be able to carry out the regurgitation of the viscous liquid V enclosed in the container 18 by \*\*\*\*\* width. The container 18 is in the state where the nozzle 28



was made to project outside from the hole 30 established in the end 12a of the body part 12 of the housing 16, and is accommodated in the body part 12.

[0014]When the viscous liquid V of the maximum volume is sealed hermetically in the container 18, the movable end wall 24 is arranged near the open end 22a of the cup shape peripheral wall 22, and the viscous liquid V is extruded from the nozzle 28 by pushing in the movable end wall 24 in the container 18 along with the peripheral wall 22 from the position. Therefore, the discharge quantity of the viscous liquid V is proportional to the movement magnitude of the movable end wall 24.

[0015]The hot melt adhesive in which the viscous liquid V sealed hermetically in the container 18 consists of polyvinyl acetate etc., for example, It has comparatively high viscosity (for example, hot melt adhesive (at the time of melting) several 1000– tens of thousands centipoises and sealant hundreds of thousands centipoises) like sealant, such as a silicone series, a polyurethane system, and acrylic. When using the equipment for launching 10 as an application device of hot melt adhesive, it is desirable to enable it to plaster, equipping the outside surface of the cup shape peripheral wall 22 of the container 18 with the heating construction of a planar heating element etc., for example, heating the container 18 from the outside, and fusing adhesives.

[0016]The container of not only the container of such a structure but various gestalten, such as a flexible bag-shaped container for example, can be used for the equipment for launching 10. The nozzle is beforehand installed in the end 12a of the body part 12 of the housing 16, and when a container is accommodated in the prescribed position of the body part 12, it can also have composition that the inside of a container and a nozzle are opened for free passage.

[0017]The lid member 32 which can be opened and closed at a rocking ceremony is equipped with the other end 12b by the other end 12b of the body part 12 of the housing 16. The lid member 32 is connected with the body part 12 via the hinge 34 that some housing 16 should be constituted. While the lid member 32 makes possible extrusion work by the extrusion member 36 mentioned later in the closed position of a graphic display, it enables attachment and detachment and exchange of the container 18 in the open position which is not illustrated.

[0018]The extrusion member 36 is provided with the following.

The shaft 40 acceptance support of the axis directional movement of is enabled at the breakthrough 38 provided in the lid member 32.

The ejector plate 44 which has the press surface 42 which is fixed to the end of the shaft 40 and abbreviated–intersects perpendicularly with an axis.

The handle 46 formed in the other end of the shaft 40.

When the lid member 32 is in the closed position of a graphic display, the extrusion member 36 and the breakthrough 38 are positioned on the lid member 32 so that the shaft 40 may be arranged [ which were accommodated in the body part 12 / the container 18 and approximately concentric ]. The shaft 40 has only the length which can move the ejector plate 44 to the position which extrudes the viscous liquid V in the container 18 to abbreviated completeness without making the handle 46 engage with the lid member 32.

[0019]As for the shaft 40, it is still more preferred to have the four circle peripheral surfaces 40a arranged at equal intervals and the four common peripheral surfaces 40b which connect these circle peripheral surface 40a mutually to a hoop direction on the same cylinder side. Such peripheral surface shape of the shaft 40 is for canceling

intentionally the locking action of the one way clutch member 74 mentioned later, and is behind explained in full detail about this.

[0020]Communicating formation of the crevice 48 is carried out to the breakthrough 38 of the lid member 32 in the side, and the brake member 50 is arranged in the crevice 48. The brake member 50 is energized in the direction which projects from the crevice 48 with the spring 52, always contacts the surface of the shaft 40 received by the breakthrough 38, and brakes movement of the shaft 40 by predetermined frictional force. When moving in the direction (the 1st direction (the arrow A shows to drawing 1) is called hereafter) in which the ejector plate 44 goes to the end 12a of the housing body portion 12 along the axis of the shaft 40, the extrusion member 36, The press surface 42 is contacted by the movable end wall 24 of the container 18, and the ejector plate 44 pushes in the movable end wall 24 in the container 18 along with the peripheral wall 22, and it acts so that this may extrude the viscous liquid V from the nozzle 28.

[0021]The equipment for launching 10 is provided with the operation member 54 for moving the extrusion member 36 in the 1st direction A by manual operation. The operation member 54 is provided with the following.

The trigger 58 which adjoins the grip part 14 of the housing 16 and is attached in the body part 12 rockable about the pivot 56.

It is pivoted by the trigger 58 by the pivot 60 by a end face, the guide 62 provided in the body part 12 is met, and it is the link 64 movable to linear shape.

The lever 70 which is attached in the lid member 32 rockable about the pivot 66, and arranges the nail 68 of an end in the position with which the free end 64a of the link 64 can engage.

The spring 72 with which it is installed between the lever 70 and the lid member 32, and the nail 68 carries out rotational energization of the lever 70 in the direction close to the free end 64a of the link 64.

The pivots 56, 60, and 66 of each other are arranged in parallel. Between the trigger 58 and the housing 16, energizing means, such as a spring with which the free end 64a of the link 64 carries out rotational energization of the trigger 58 in the direction which separates from the nail 68 of the lever 70, can also be established further.

[0022]By what the trigger 58 is strained for to the action position shown in drawing 2 from the initial position (position of rest) which a worker supports the grip part 14 with one hand, hangs a desired finger on the trigger 58, and is shown in drawing 1 (it is operated). The free end 64a of the link 64 can be made to be able to engage with the nail 68 of the lever 70, energization of the spring 72 can be resisted, and the lever 70 can be made to rock to a counterclockwise rotation by a diagram (an arrow shows the move direction of each component at the time of operation to drawing 2). a worker — the trigger 58 to a finger — detaching (operation release is carried out) — the lever 70 rocks to the clockwise rotation of a figure by energization of the spring 72, and the lever 70, the link 64, and the trigger 58 return to the initial position of drawing 1.

[0023]Furthermore, while the equipment for launching 10 permits movement in the 1st direction A of the extrusion member 36, As a one way clutch means to restrict movement in the direction (the 2nd direction (the arrow B shows to drawing 1) is called hereafter) which goes to the other end 12b of the direction 12, i.e., a housing body portion, which returns to the initial position of the extrusion member 36, it has the one way clutch member 74. The one way clutch member 74 is provided with the following.



The outer case 78 pivoted by the other end of the lever 70 via the pivot 76 as shown in drawing 3 and drawing 4.

The container liner 84 with the flange part 82 installed to a diameter direction by the axial end of the cylindrical section 80 and the cylindrical section 80 accommodated in the outer case 78.

The spherical rolling element 88 accommodated in each of the four hollow parts 86 formed in the cylindrical section 80 of the container liner 84 so that rolling is possible. The end plate 90 which is fixed to the container liner 84 with a bolt (not shown) in the opposite hand of the flange part 82, and pinches the outer case 78 fixed between the flange parts 82.

The pivot 76 is arranged in parallel with the pivots 56, 60, and 66.

[0024]The outer case 78 is formed as the truncated cone (truncated cone or truncated pyramid)-like surface where the inner surface 92 which counters the cylindrical section 80 of the container liner 84 inclines to an axis. Preferably, the edge by the side of contraction of the truncated cone-like inner surface 92 of the outer case 78 (in the case of a truncated-cone-form inner surface the byway side) is contacted by the surface of the cylindrical section 80 which adjoins the flange part 82 of the container liner 84, and shakiness between the outer case 78 and the container liner 84 is prevented. the container liner 84 and the end plate 90 — the shaft 40 of the extrusion member 36 — an axial direction — the cylindrical axial direction breakthroughs 94 and 96 received movable and rotatable are formed, respectively. It has an ellipse section about a flat surface parallel to an axis, penetration formation is carried out in a hoop direction regular-intervals position to a diameter direction at the cylindrical section 80, and each hollow part 86 of the container liner 84 is opened for free passage by the axial direction breakthrough 94, respectively.

[0025]Therefore, if the shaft 40 is equipped with the assembled one way clutch member 74, The space S of the ellipse section where a diameter direction dimension decreases gradually to the flange part 82 side of the end plate 90 side to the container liner 84 (drawing 5) is formed by two or more hollow parts 86 of the container liner 84, and in these space S, the rolling element 88 is accommodated so that rolling is possible. When correspondence arrangement of each circle peripheral surface 40a of the shaft 40 is carried out at each hollow part 86, here, The distance between the circle peripheral surface 40a of the shaft 40 and the inner surface 92 of the outer case 78 which form each space S, It is slightly set up greatly rather than the diameter of each rolling element 88 by the side (namely, the extension side of the truncated cone-like inner surface 92) close to the end plate 90, and is slightly set up small rather than the diameter of each rolling element 88 by the side (namely, the contraction side of the truncated cone-like inner surface 92) close to the flange part 82. When the shaft 40 is rotated and correspondence arrangement of each common peripheral surface 40b is carried out at each hollow part 86, the side to which the distance between the common peripheral surface 40b of the shaft 40 and the inner surface 92 of the outer case 78 which form each space S approached the flange part 82 is also slightly set up greatly rather than the diameter of each rolling element 88.

[0026]In the one way clutch member 74 which has such composition. To each hollow part 86, where correspondence arrangement is carried out, each circle peripheral surface 40a of the shaft 40, If the shaft 40 received by the breakthrough 94 of the container liner 84 moves in the direction which goes to the flange part 82 from the end

plate 90 to the container liner 84, Each rolling element 88 moves to the side which rolled in each space S and approached the flange part 82, and is pinched fixed between each circle peripheral surface 40a of the shaft 40, and the inner surface 92 of the outer case 78 (refer to drawing 5 (a) and (b)). As a result, movement in the direction which goes to the flange part 82 from the end plate 90 of the shaft 40 to the clutch member 74 is stopped.

[0027]On the other hand, where correspondence arrangement of each circle peripheral surface 40a of the shaft 40 is carried out at each hollow part 86, If the shaft 40 received by the breakthrough 94 of the container liner 84 moves in the direction which faces to the end plate 90 from the flange part 82 to the container liner 84, Each rolling element 88 moves to the side which rolled in each space S and approached the end plate 90, and it can exercise now freely between each circle peripheral surface 40a of the shaft 40, and the inner surface 92 of the outer case 78 (refer to drawing 6). As a result, movement in the direction which faces to the end plate 90 from the flange part 82 of the shaft 40 to the clutch member 74 becomes free.

[0028]Where correspondence arrangement of each common peripheral surface 40b of the shaft 40 is carried out at each hollow part 86, it is not concerned in the move direction of the shaft 40, but each rolling element 88 exercises freely in each space S. As a result, the shaft 40 is freely movable also in the direction which goes to any of the flange part 82 and the end plate 90 to the clutch member 74 (refer to drawing 7 (a) and (b)).

[0029]The angles of gradient to the axis of the inner surface 92 of the outer case 78 are 10 degrees – 30 degrees preferably. In this case, it is not necessary to set up the axial direction size of the hollow part 86 like a graphic display quite more greatly than the rolling element 88. theoretically, a crevice very minute at the time of clutch release (drawing 6 and drawing 7) forms between the peripheral surfaces 40a and 40b of the shaft 40, the rolling element 88, and the inner surface 92 of the outer case 78 — even having — if it carries out, an operation of the above one way clutch members 74 will be obtained. The material of the outer case 78 and the container liner 84 desirable as a transmitting power element is a material excellent in the mechanical strength of stainless steel etc. As for the shaft 40 and the rolling element 88, consisting of hardening steel is preferred. As for the end plate 90, consisting of lightweight materials, such as aluminum, is preferred because of a weight saving. Or the one way clutch member which forms an outer case, a container liner, and an end plate in one from an identical material can also be used.

[0030]The shaft 40 is equipped with the one way clutch member 74 so that the ejector plate 44 of the extrusion member 36 may be arranged at the end plate 90 side. Therefore, the one way clutch member 74 turns the end plate 90 to the end 12a side (namely, the container 18 side) of the housing 16, and is installed movable in the lid member 32 via the lever 70 (refer to drawing 1). When the guide (not shown) which it shows to the axial direction of the shaft 40 is provided in the lid member 32 and the lever 70 rocks the one way clutch member 74 about the pivot 66 to it preferably, the one way clutch member 74 can move in the 1st direction A and the 2nd direction B in parallel with the shaft 40.

[0031]An operation of the equipment for launching 10 which has the above-mentioned composition is explained below. First, the handle 46 of the extrusion member 36 is operated and the extrusion member 36 is set as the position in which each circle



peripheral surface 40a of the shaft 40 carries out correspondence arrangement at each hollow part 86 of the one way clutch member 74. While each circle peripheral surface 40a can detect with the touch that correspondence arrangement was carried out to each hollow part 86 at this time, it is desirable to install holding structures (not shown), such as a ball plunger which can hold the extrusion member 36 in that state, for example in the lid member 32.

[0032]Subsequently, operate the operation member 54 from the initial position of drawing 1, the lever 70 is made to rock to a counterclockwise rotation about the pivot 66 via the trigger 58 and the link 64, and the one way clutch member 74 is moved in the 1st direction A. At this time, the direction of relative displacement of the shaft 40 and the one way clutch member 74, Since the shaft 40 mentioned above serves as a direction which goes to the flange part 82 from the end plate 90, in the one way clutch member 74, each rolling element 88 is pinched fixed between the shaft 40 and the outer case inner surface 92, and the shaft 40 is stopped by the one way clutch member 74. As a result, the extrusion member 36 resists the frictional force of the brake member 50 exerted on the shaft 40, and moves in the 1st direction A with the one way clutch member 74.

[0033]The migration length to the 1st direction A of the extrusion member 36 44, i.e., an ejector plate, is decided by length which strains the trigger 58 here, the movable end plate 24 of the container 18 moves according to it, and the viscous liquid V of the specified quantity is extruded from the nozzle 28 (drawing 2). The length which strains the trigger 58 can be suitably adjusted by changing the position of the guide 62, if the function of the stopper which engages with the link 64 is given to the guide 62 provided, for example in the body part 12 of the housing 16 when the link 64 carries out prescribed distance movement from an initial position.

[0034]If operation of the operation member 54 is canceled of the action position of drawing 2, the lever 70 will rock to a clockwise rotation about the pivot 66 by energization of the spring 72, and the one way clutch member 74 will move in the 2nd direction B. Since the shaft 40 of the extrusion member 36 is braked by the brake member 50 by predetermined frictional force at this time, Between the shaft 40 and the one way clutch member 74, the relative displacement to the direction in which the shaft 40 mentioned above faces to the end plate 90 from the flange part 82 arises, each rolling element 88 becomes free between the shaft 40 and the outer case inner surface 92, and the shaft 40 is released from the one way clutch member 74. As a result, the one way clutch member 74 moves in the 2nd direction B independently from the extrusion member 36, and returns to an initial position.

[0035]Thus, the viscous liquid V of the specified quantity is extruded from the nozzle 28 by one operation of the operation member 54, and the operation member 54 and the one way clutch member 74 return to an initial position in preparation for the next operation. the extrusion operation by the extrusion member 36 cancels -- having (that is, the external pressure added to the viscous liquid V is eliminated) -- within the container 18, it is predicted that the viscous liquid V expands with the internal pressure of itself. In the equipment for launching 10 concerning this invention, since it considered that the extrusion member 36 was put back in the 2nd direction B by expansion of the viscous liquid V via the movable end plate 24 as the composition permitted automatically as follows, also when the viscous liquid V expands with internal pressure, leaking out from the nozzle 28 is prevented effectively.

[0036] That is, since it is released from the one way clutch member 74 as the shaft 40 described above while the one way clutch member 74 is moving in the 2nd direction B, the extrusion member 36 has axial direction movement controlled by the power received from the movable end plate 24, and frictional force of the brake member 50. Therefore, when the power in which it is added to the movable end plate 24 by expansion of the viscous liquid V exceeds the frictional force of the brake member 50, the extrusion member 36 will move in the 2nd direction B automatically.

[0037] If the relative movements of the extrusion member 36 and the one way clutch member 74 are explained, although the extrusion member 36 is always movable in the 1st direction A, it is substantially unmovable in the 2nd direction B to the one way clutch member 74. Having said here, "It is substantial" explains that minute movement in the 2nd direction B of the extrusion member 36 is permitted corresponding to the axial direction size of the hollow part 86, while the rolling element 88 moves from the free position of drawing 6 to the pinching position of drawing 5 within the hollow part 86 of the one way clutch member 74.

[0038] Therefore, while the one way clutch member 74 is moving in the 2nd direction B, Usually, since the movement speed of the extrusion member 36 by expansion of the viscous liquid V is slower than the movement speed of the one way clutch member 74, it moves in the 2nd direction B within the equipment for launching 10, carrying out relative displacement of the extrusion member 36 in the 1st direction A to the one way clutch member 74. And when the one way clutch member 74 arrives at the initial position of drawing 1, and stops and expansion of the viscous liquid V is continuing, the extrusion member 36 is stopped by the one way clutch member 74 through slight time for the rolling element 88 to move from the free position of drawing 6 to the pinching position of drawing 5. Thus, while the break through from the nozzle 28 resulting from expansion of the viscous liquid V is reduced or prevented after operation release of the operation member 54, the contamination to the viscous liquid V of the invasion air from the nozzle 28 is prevented. When expansion of the viscous liquid V has already ceased at the time of a stop of the one way clutch member 74, additional movement in the 2nd direction B of the extrusion member 36 is stopped by the one way clutch member 74. As a result, the contamination to the viscous liquid V of the invasion air from the nozzle 28 is prevented.

[0039] When [ at which abbreviation etc. spread the movement speed of the one way clutch member 74 on the movement speed of the extrusion member 36 by adjusting the operating speed of the fingers with which a worker releases the trigger 58, for example etc. ] it controls, the extrusion member 36 moves in the 2nd direction B in one with the one way clutch member 74. And when expansion of the viscous liquid V ceases and the one way clutch member 74 usually stops in an initial position before the one way clutch member 74 arrived at the initial position of drawing 1, additional movement in the 2nd direction B of the extrusion member 36 is prevented by the one way clutch member 74. Thus, while the break through from the nozzle 28 which originated in expansion of the viscous liquid V after operation release of the operation member 54 is prevented, the contamination to the viscous liquid V of the invasion air from the nozzle 28 is prevented.

[0040] Thus, the time which the extrusion member 36 can move in the 2nd direction B after operation release of the operation member 54 is restricted by the time which the one way clutch member 74 requires for moving from an action position to an initial



position. The distance which the extrusion member 36 can move in the 2nd direction B is restricted by the migration length and transit time from the action position of the one way clutch member 74 to an initial position. To then, the grade which can move the movable end plate 24 after operation release of the operation member 54 in the equipment for launching 10 without the viscous liquid V leaking out from the nozzle 28 by expansion of the viscous liquid V predicted. If only it adjusts the frictional force of the brake member 50 to the movement speed to the 2nd direction B of the one way clutch member 74, and the shaft 40 to such an extent that movement in the 2nd additional direction B of the extrusion member 36 after the expansion end of the viscous liquid V can be prevented, A break through of the viscous liquid V from the nozzle 28 can be reduced or prevented automatically, without a worker performing any special (skill is required) operation.

[0041]As for the extrusion member 36 released from the one way clutch member 74, in order to prevent effectively a break through of the viscous liquid V from the nozzle 28 in the equipment for launching 10, it is preferred that it can move to an axial direction freely as much as possible. Therefore, the frictional force added to the shaft 40 by the brake member 50 is a range which can release the shaft 40 from the one way clutch member 74 easily at the time of operation release of the operation member 54, and is desirable. [ of an as much as possible small thing ] As for the movement speed to the 2nd direction B of the one way clutch member 74, for the same reason, it is preferred that it is larger than the movement speed to the 2nd direction B of the movable end plate 24 resulting from expansion of the viscous liquid V and the extrusion member 36.

[0042]it described above — as — the extrusion member 36 — expansion of the viscous liquid V — \*\* — the frictional force of the brake member 50 which is always acting after producing in fixed quantity — and it stops by operation of the one way clutch member 74 eventually. Since the viscous liquid V in the container 18 is expanding automatically at this time, without being influenced by external force, air is not made to invade from the nozzle 28, but it is in the state of extruding properly from the nozzle 28 promptly by the next extrusion work. Then, if the operation member 54 is operated again and the extrusion member 36 is moved in the 1st direction A via the one way clutch member 74, Without producing a loss substantially in operation of the operation member 54, extrusion pressure is promptly added to the viscous liquid V from the move starting point of the extrusion member 36, and the viscous liquid V of the specified quantity is correctly extruded from the nozzle 28.

[0043]thus, the thing for which operation (the trigger 58 wringing) of the operation member 54 is repeated — one operation — the viscous liquid V in every [ the specified quantity ] and the container 18 — abbreviated — it can extrude thoroughly. When operation of the operation member 54 becomes impossible, it is perceived that the container 18 became empty. Then, a worker operates the handle 46 of the extrusion member 36, rotates about 45 degrees of shafts 40, and sets the extrusion member 36 as the position in which each common peripheral surface 40b of the shaft 40 carries out correspondence arrangement at each hollow part 86 of the one way clutch member 74. Thereby, the extrusion member 36 can be independently moved now in any direction of the 1st direction A and the 2nd direction B from the one way clutch member 74. Then, if the ejector plate 44 moves the extrusion member 36 to the position which approaches the lid member 32 most, the lid member 32 will be rotated about the hinge 34, and it will become possible to open the other end 12b of the body

part 12 of the housing 16. Thereby, the used container 18 can be picked out from the housing 16, and it can exchange for a new thing.

[0044]The peripheral surface shape of the shaft 40 of the extrusion member 36 is because attachment and detachment and exchange of the container 18 are enabled as mentioned above. Therefore, when other means which enable attachment and detachment and exchange of the container 18, such as enabling it to separate the lid member 32 from the body part 12 of the housing 16, for example etc., are formed, it cannot be overemphasized that an approximately cylindrical shaft can be used. The outside surface of the outer case 78 of the one way clutch member 74, the inner surface 92, and the outside surface of the cylindrical section 80 of the container liner 84 can also be made into the shape which has not only the shape of a circular section like a graphic display but a polygon, and an ellipse form section.

[0045]

[Effect of the Invention]The one way clutch member which controls axial direction movement of an extrusion member this invention so that clearly from the above explanation, While an operation member is interlocked with within housing, axis directional movement is possible, it engages with an extrusion member when moving in the 1st direction, and changing a container by an extrusion member and extruding viscous liquid, Since it constituted so that movement in the 2nd direction of an extrusion member might be permitted until it released the extrusion member and the one way clutch member itself stopped, when moving in the 2nd direction, About viscous liquid leaking out, it became possible from the nozzle after operation release of an operation member to prevent automatically, without needing any a worker's special operations. therefore -- according to this invention -- after operation release of an operation member -- a break through of the viscous liquid from a nozzle -- a worker's skill -- \*\*\*\*\* -- it can prevent easily and the manual type equipment for launching of viscous liquid excellent in the operativity which can moreover be manufactured cheaply is provided.

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[Translation done.]